

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

[PRICE 6D.]

IN THE VICE-WARDEN'S COURT.

THE PATENT SAFETY FUSE.
FOR BLASTING ROCKS IN MINES, QUARRIES, AND FOR SUBMARRINE OPERATIONS.—This article affords the safest, cheapest, and most expeditious mode of effecting the very dangerous operation. From many testimonials in the possession of the Patentee, it is known that every mine, quarry, and the Kingdom, they select the following letter, recently received from John Taylor, Esq., F.R.S., &c., &c.:—
“I am very glad to hear that my recommendations have been of any service to you. They have been given from a thorough conviction of the great utility of the Safety Fuse, and I am quite willing that you should supply my orders of it.”
Manufactured and sold by the Patentees, RICKFORD, SMITH, and CO.,
BIRMINGHAM, ENGLAND.

by. Books, with plates describing all the works, are sold at the Y-mat, price 1s.

ELECTRICITY OF MINERAL

it of wire in contact with the damp rock, and the sulphur of copper in this. To ascertain if the current was at all connected with the stone, the an-

was placed on a damp board, when the deflection was found to be the same as before, clearly proving it to arise from the state of the metal considered in its electric relation to the ore. Contact was made by the large coil at 2, when the needle was deflected nearly 70°, but the direction of the current was now from east to west.* This being contrary to the direction ascertained in former experiments, demanded the most rigorous investigation. The current was analysed by the plates of zinc and platinum, but its direction still continued the same.

7. It was agreed that the observer should number aloud the oscillations of the needle, in such order that the even number should indicate the moment at which the needle arrived at its extreme deflection, raising or lowering his voice according to the amount deflected. The object of this was, that the person producing contact should make his own observations on the nature of the contact; which arrangement enabled him, first, to discover that contact with the ore of the lode was followed by an elevation of voice, also that the presence of water enveloping the end of the wire in connection with the ore was productive of greater deflection, but had no effect when applied to the matrix of the lode or its sides.

8. Contact was made in many places along the cross-course, between the north and south lode, without producing any deflection of the needle; but as soon as the wire touched the ore in the south lode at 6 the needle was powerfully deflected in the direction, indicating a current flowing from west to east, as in former experiments.

9. The connections were made exactly as on the last occasion, and the same results were produced, the direction of the current between the point 2 in the north lode, and point 3 in the south lode, being from east to west. The large coil was now connected with that portion of the north lode lying at the point 7, being carried round through the cross-course, giving an extended length of wire about twenty-two fathoms. The deflections were now 50°, and the current from west to east, which is the greatest steady deflection yet obtained with the heavy needle.

10. The large galvanometer and wire being fixed, as in the last experiment, the wire was carried round to the eastern end of the lode, and the connection made with point 7, the current was found to be in the same direction, from west to east. On this occasion the current was not allowed to flow through the whole of the wire on the coils, but small wires were attached, by sliding screws, which completed by its connection with the galvanometer the electric circuit; this was found to increase the amount of deflection slightly. We now decided, by a repetition of experiments, that from all the points 1, 2, 3, 4, 5, 6, and 7, the electric current was passing from west to east, but between the point 2 and any of the others the currents appeared to take a different direction.

11. The large galvanometer was now fixed at 4, and the connection made at 7, and with the point at 3 the current was indicated as from east to west. Between the point 7 and points 5 and 6 the current was evidently from west to east, as it was also between any other two parts of the two lodes tried at this time. It is not quite easy to explain the very peculiar local disturbance which was found to prevail in close proximity with the cross-course at 3; but our experiments lead us to the conclusion, that the current in these lodes is constant from west to east, the deviation found at 3 being, no doubt, dependent upon some peculiarly local effect.

Being desirous of endeavouring to effect chemical decomposition, by the agency of the electric currents flowing through the mineral lodes, we connected two wires with the points 7 and 3—these being chosen from the convenience of their situation. The ends pointed with platinum wire were placed in a phial, which contained a solution of sulphate of copper. This being arranged, was left in the mine for a few days. When the phial was next examined one of the wires had been removed, no doubt by the curiosity of the miners, but the wire which remained in the phial was sufficiently coloured by copper to convince us we were not disappointed in our expectations. How long the circuit may have been perfect cannot be ascertained. The experiments in East Pond Mine have all been several times repeated with the greatest care, but as the results have been invariably the same as those detailed it is deemed unnecessary to recapitulate them.

Some experiments have been recently made at Pennance Mine, by Mr. R. W. Fox, assisted by Mr. Joshua Fox, the following results, with which Mr. R. W. Fox has kindly favoured me, I have, from their importance, with that gentleman's permission, added to those obtained by Mr. Phillips and myself.—R. H.

Pennance Mine is a kiler, two lodes bearing nearly east and west (magnetic) they contain much arsenical and iron pyrites, interstratified with oxide of tin and sulphate of copper and lead. The more northerly lode about five feet thick, and dipping a little towards the north; it has been worked sixteen fathoms under the surface. The other lode has not yet been run deeper than eight fathoms, two feet wide, and at present inclined towards the south, but it has not yet been run deep enough to determine the general dip of the lode with certainty. All the experiments on the north lode gave currents through the apparatus from east to west, and on lode the experiments of the south lode, where they were tried, but they were less energetic. In the east part of the north lode, at the six fathom level, the current caused the needle to revolve quickly, after producing and breaking contact a few times. Contact was made with the ore points, by means of blocks and screws, by plates of copper, zinc, and platinum in succession, and also by the points of the wires merely, but without any marked difference in the results under these different circumstances. Nor was there any great difference in the results: where the contact was made with different ores at the same station, thus the positive current was not less energetic where the contact was made with galena, as on one point, than with iron pyrites nearly contiguous to it. All these facts show the independent nature of these currents, as it respects the apparatus or accidental circumstances. On connecting the back of the north lode immediately under the surface, containing arsenical pyrites, with a portion of the same lode further west, in the six fathom level, a maximum deflection of 80° to 85°, was produced with copper wire, folded up, and pressed into a bundle, for making contact with the ore points. There was a plate of zinc afterwards substituted for the copper wire at the surface, from whence the positive current was derived without any diminution of effect, and, under these circumstances, Mr. Fox was enabled to impart magnetism to a horseshoe bar of iron, with several coils of copper wire round it, sufficient to act, though feebly, on a compass needle not very delicately poised. The stronger current below, would, doubtless, have produced a much greater effect.

TRIAL OF THE CONSTANT INDICATOR UPON THE CORNISH ENGINE AT THE EAST LONDON WATER-WORKS.

(In a late Number we published the description of Professor Mosley's Indicator, as detailed by him in a communication to the Institution of Civil Engineers, and now commence the interesting discussion which ensued, and which we shall continue in following Numbers until completed.)

Mr. CURTIS, in compliance with the request of Professor Mosley, illustrated his description by setting the instrument in motion, showing that the registration depended upon the revolutions of the integrating wheel; he demonstrated the cause of motion without pressure, and pressure without motion; in the former case the integrating wheel being stationary at the apex of the cone while revolving does not receive any impulse from the contact with it, and, therefore, does not register; in the latter case, the surface of the cone upon which the integrating wheel traverses, being at rest, does not communicate any relative motion to it, and, consequently, no registration can take place; but, when motion and pressure are combined, the cone revolving, and the integrating wheel travelling, from the apex some distance towards its base, the exact product of the motion of the cone and the steam's pressure upon the piston would be registered by the amount of the revolution of the integrating wheel.

Mr. WICKSTEED observed that every facility had been afforded to Professor Mosley for applying his new indicator for the purpose of ascertaining the duty performed by the Cornish engine at Old Ford, but that he had not at all interfered with the experiments, being desirous of ascertaining whether the results would correspond with his trials. That after the work of the engine had been registered, while it was making about 175,000 strokes, the mean result, as stated by Professor Mosley, was as nearly that arrived at by Mr. Wicksteed, that he had no doubt of the accuracy of the machine as a good indicator of the real duty performed by the engine; the difference in the result of the mean pressure of the steam, deducting the vacuum, or 0.75 lbs., was 0.13 lbs.—viz., according to Mr. Wicksteed's experiments, 19.94—0.75=19.19 lbs., and, according to Professor Mosley, 19.93 lbs.; this difference might arise from a variation in the mean length of stroke during the two sets of experiments—from a slight variation in the point at which the steam had been cut off—from a variation in the level of the water in the pump well, or other practical causes; the difference, however, was so insignificant, that he would rely on the accuracy of Professor Mosley's indicator, and allow the possibility of a slight error in his own experiments.

Mr. FARR observed, that Professor Mosley's instrument must be influenced by variations in the length of stroke, for, whenever the piston makes a long stroke, the time and the force of registering which must be increased, and would register a higher number than they would be in case of a shorter stroke, supposing the impelling force exerted by the steam to be always the same. If the instrument could be really made to give its results according to the actual length of all the working strokes made during the time of observation, by truly aggregating these varying lengths into one sum, the results would be true from the usual uncertainty respecting the average length of stroke. In the monthly reports of engines in Cornwall the performance is reckoned according to some required length of stroke, which had been fixed upon for each engine, when it was first reported, and it is

afterwards assumed that an departure from that required length has taken place, when in fact such departure does often occur. It would be very desirable to have a moving card applied to the new instrument, in order to indicate the impelling force of the steam in the cylinder, by tracing curves on paper like those by the ordinary indicators. This, it appeared, might be done with the advantage of causing the paper on which the curve is drawn to travel onwards, and bring fresh paper into its place, so as to obtain a series of distinct curves for as many succeeding strokes. The form of the springs of Professor Mosley's instrument would be a decided improvement if substituted for the spiral spring of ordinary indicators. Mr. FARR had applied to an ordinary indicator a mode of exhibiting, at a glance, whether the engine was exerting more or less force than its ordinary appointed task; the plan answered that purpose, but, as it required the indicator to be always in action, the spring of the indicator broke after working more than two days—he therefore abandoned it. The springs in the new instrument were proved, by the trial at Old Ford, to be capable of enduring continual exertion without breaking. The Professor had stated that the scale of force of the new springs was found to be exactly, according to theory, equal divisions with equal forces; this might be expected, because the force of the springs was small, and the bending force acted in a direction nearly at right angles to the length of the springs. In ordinary indicators the scale should not always be equal divisions, because the wire of the spring being wound spirally into a screw of small diameter, the spiral obliquity of the thread of each screw becomes more oblique to the direction of the bending force, as the spring is stretched, and less oblique as the spring is compressed, and hence the scale of pounds per square inch, by which the curve should be measured, for summing up the results, ought to be a scale of unequal divisions. The indicators originally used by Boulton and Watt were of a large size, with a long and powerful spring curled into a cylindrical form, as large in diameter as could be included in the cylinder of the indicator, and the motion allowed to the piston by the spring was very short; such indicators were judiciously proportioned, and they do not show any sensible inequality of divisions in their scale. But, recently, indicators have been frequently made without the knowledge of their true principle, and the rules of proportion are not observed, so that it will sometimes be found, on actual trial of such instruments with weights, that their scale of pounds per square inch is not in equal divisions, although it is usual to employ a scale of equal divisions for summing up the curves traced by them. In Boulton and Watt's indicators the scale of pounds per square inch was formed from actual trial with weights, but such trials were made when the indicator was cold, and dismounted from its place upon the steam-engine. A much better mode is to apply the weights on the upper end of the piston-rod when the indicator is placed on the cylinder of the engine, while it is hot, its piston being supplied with the same quantity of oil, and the spring being in the same state as when it is in use. The depression of the piston by the weights is recorded by drawing a line with the pencil of the instrument on the card itself, in the same manner as the usual atmospheric line is drawn thereon. A series of lines thus drawn, with given weights, become so many original stages for subdividing between them, to form a true scale for summing up the curve described under the same circumstances and nearly at the same time. Professor Mosley's instrument had two cylinders and pistons operating in concert on the same piston-rod, and springs of peculiar construction, to indicate the unbalanced pressure exerted by the steam to impel the piston of the engine. The elastic force wherewith the steam acts above the piston (called the positive pressure or plenum) is shown by a common indicator, but the elastic force wherewith the uncondensed steam is at the same time reacting beneath the piston (called the negative pressure, or imperfect exhaustion or vacuum) is not shown; hence the observations are limited to two old halves of the stroke made by the piston; those halves being commonly the plenum during the descent, and the exhaustion during the ascent of the piston, it is taken for granted that the other two old halves are the same as those which are observed, although such assumed parity is not always the true state of the case. In the new instrument the indication that it would make by drawing on a card would be that of the difference subsisting between the plenum above and the exhaustion beneath the piston of the engine, during its descent and ascent, wherefore it would indicate on one card as much as two ordinary indicators can do on two cards, if they are applied one to the top and the other to the bottom of the cylinder of the steam-engine; in that case each indicator shows on its own card what the elastic force of the steam is during the plenum, and what it is during the exhaustion; but the required result (which is the difference between the two) must be obtained by combining together in the computation those distinct curved lines which are drawn on two separate cards. Professor Mosley's combined indicator pistons, acting on the same springs, would at once indicate such difference, by the curve which it would trace on the one card.

In answer to a question from Mr. PARKER, as to whether the new instrument had been put to any other test than its apparent agreement with Mr. Wicksteed's estimate of the resistance overcome, and whether the common indicator had been applied to the engine at the same time? Prof. MOSLEY said that he had not compared the instrument with any other, but had subjected Mr. Wicksteed's calculations to a rigid investigation, and felt quite satisfied that they approximated closely to the truth. He relied upon them as corroborations of the accuracy of the instrument.

Mr. PARKER observed that it would have been more satisfactory to engineers to have been assured that every means had been taken to demonstrate the truth of the results recorded by an instrument which had such important functions in view. He wished to know in what manner the pressures denoted had been ascertained—whether by weights, or by comparing them with a mercurial column? He had found the latter mode more exact than weights in verifying the scale of the common indicator, as the instrument being heated was then in precisely the same state as when it was in use. He had found that a certain amount of correction was frequently necessary, as both the spring and the amount of piston friction were affected by heat.

Professor MOSLEY replied that the instrument had not been compared with the mercurial column, but that the resistance of the springs, and the friction of the piston and instrument generally, had been ascertained by very accurate experiments, so that he had full confidence in the results.

Mr. PARKER said that, notwithstanding the respect and deference he felt for Professor Mosley's attainments and ingenuity, his past experience would not permit him to place entire confidence in the results afforded by the instrument—indeed, he considered them to be altogether fallacious, as representing the force acting on the piston of the Old Ford engine. He could not admit that the apparent error between Mr. Wicksteed's computation of resistance, and the constant indicator's registration of force, amounted to proof of the instrument's accuracy, for, it seemed to him, that Mr. Wicksteed had omitted to take into account one important item of force, without the exertion of which a piston could not be brought from a state of rest into a state of motion—he referred to the force required to give velocity to the piston. Mr. Wicksteed had weighed the greater part of that resistance which might be called ponderable, and had estimated the remainder, assigning about 13 lbs. per square inch on the piston as the total amount, after deducting the resistance in the piston's descent arising from uncondensed steam. Thus, an elastic force of 13 lbs. on the piston would counterpoise a resistance of 13 lbs., but motion would not ensue until a superior force were applied. Considering the number of strokes made by this engine per minute, Mr. PARKER could not estimate the velocity of the piston at less than from 100 to 100 feet per minute, which was very great for this enormous mass, and would require the exertion of proportionate power. He regarded the piston of the engine loaded with 13 lbs. per square inch, as he would a ball of 13 lbs. weight in a gun balanced by a fluid of a corresponding elastic force; but such ball would remain motionless, unless it were propelled by some additional force. This state of things had been demonstrated by Prof. BACON—the preparation for motion. Now, as Mr. Wicksteed's estimate proceeded on further than the production of this state of things, and as Professor Mosley's constant indicator recorded the mean pressure of the steam in the cylinder as barely equal to it, he could not assent to the accuracy of either method of determining the total resistance overcome by the steam. Mr. PARKER would cite the experience of others as to the quantity of force actually expended in giving velocity to a Cornish engine, over and above that necessary to balance the weight at the piston-rod of the beam, friction, &c., &c. In the 8th part of vol. III. *Transactions Institution Civil Engineers*, Mr. EYRE has reported some experiments made at Mr. PARKER's suggestion, on several engines. He would cite those of the Trevithick, as the cylinder was of the same diameter as the one at Old Ford—viz., 36 inches. The water-head was equivalent to 12 lbs. per square inch on the steam piston, and when about half the total velocity was given to the piston in the in-door stroke, a pressure of about 17½ lbs. was denoted throughout the stroke, by a mercurial column, connected with the cylinder. Mr. LOWN had since transmitted to him the following abstract of experiments made on the same engine, January 31, 1842:—"Two indicators were used at the same time, and an open mercurial gauge. The engine was held in doors until the mercury became stationary, in order to ascertain the minimum quantity of steam pressure necessary to produce motion. The pressure was 13 lbs. per square inch, when the water-head was 12 lbs." Hence, then, a force of 13 lbs. was found requisite to establish an equilibrium between the power and resistance, and a further force of 4½ lbs. per square inch was necessary in order to urge the mass at about the half of its ordinary velocity. Mr. EYRE stated that two pressures were exhibited when the engine was brought in doors, and removed, and this was connected with every day experience. Now, though the Old Ford engine had not to overcome so much frictional resistance as a deep water engine, yet, having a weight to raise, according to Mr. Wicksteed, about equal to 11½ lbs. per square inch on the piston, Mr. PARKER was of opinion that this result could be effected, at the usual working velocity, with less than 14 or 15 lbs. pressure of steam per square inch. He would suggest to Mr. Wicksteed to repeat Messrs. EYRE and LOWN's experiments, and aim to

work his engine with steam reduced nearly to such pressure in the boiler as would barely suffice to bring the piston down. Such experiments would confirm or invalidate the results given by Professor Mosley's instrument, and probably lead to the discovery of its imperfections, should any exist. It appeared that Mr. Wicksteed conceived a greater amount of elastic force to be required to perform a stroke in proportion to the degree of expansion given to the steam in the cylinder. He would quote the pressures deduced by Mr. Wicksteed under five cases of expansion, as they exhibited some curious anomalies. They were taken from Table VI. of Mr. Wicksteed's Treatise. According to his table, when the steam was stopped at 6 feet of the stroke, the mean force exerted during the stroke of 10 feet was 13 lbs. per square inch; at 4½ feet, 13½ lbs.; at 4 feet, 14½ lbs.; at 3½ feet, 15½ lbs.; and at 3 feet, 16½ lbs. It must be observed, that in every one of these cases, the resistance as appreciated by Mr. Wicksteed, amounting to 13 lbs. per square inch, was a constant quantity, so that, for some unexplained reason, an invariable load appeared to require a variable force to overcome it—a sliding scale of power, given as the measure of a constant resistance. It was possible that some small difference might have existed in the velocity of the stroke in these cases; it was also possible that some error existed in the method used for determining the pressures, or in the evaporative quantities. However this might be, it was clear there was an error somewhere, as it could not be granted that an effect, deemed constant in all these cases, could require a varying cause for its production. As these appreciations differed widely from each other, and still more so from the indications of Professor Mosley's instrument, Mr. PARKER hoped that Mr. Wicksteed would reconsider and verify this part of the subject. In corroboration of his opinion, that the acting force recorded by the instrument is too low, he would draw attention to the circumstance, that, during the period of its application (twenty-eight days), the duty performed by the engine for each 94 lbs. of coal amounted only to about 665 millions, and it would not be unreasonable to expect that at least 150 millions should have been the result under the different circumstances of mine and water-work engines, as 100 millions had been performed for some months by mine engines under a water-head equal to 12 lbs., and a mean steam pressure of 18 lbs. per square inch on the piston; whereas, if the water-head of 11 lbs. at Old Ford was overcome by an amount of force little exceeding 13 lbs. per square inch, a proportionate increase of duty ought to have resulted, but such was not the case.

LAW INTELLIGENCE.

TRESPASS—RIGHT TO COAL UNDER AN ESTATE.

NORTHERN CIRCUIT, LIVERPOOL—AUGUST 11.

JENKIN v. PEACE AND OTHERS.—The plaintiff in this action was named William Jenkin; the defendants were William Peace, John Sim, John Hayes, and Samuel Hayes, and the action was brought in consequence of an alleged trespass.

The Solicitor-General opened the case. As counsel for the defendant in this action, he said, the burden of the proof was thrown on him of the justification which was pleaded. The action arose from an alleged trespass committed on lands in the occupation of the plaintiff, who resided within the manor of Aspull. The parties on the record were not the parties substantially interested. The plaintiff was the occupier of a farm under the devise of a gentleman of the name of Walker, who purchased the estate from a person of the name of Grundy; and the first defendant was the colliery agent of Lord Balcarras. The real question intended to be raised was, whether Lord Balcarras was entitled to enter on these lands for the purpose of working and digging out the canal beneath them. The landlord of the plaintiff said that Lord Balcarras was not entitled, and Lord Balcarras claimed that right under a purchase made in the year 1812, from a family of the name of Gerard, who had possessed that property for a considerable time. The question, though a very important one, was not likely to be very interesting in the course of the trial, and it was likely it would ultimately turn into a question of law for the Judges' decision on the effect of certain deeds and evidence which would be produced. Lord Balcarras purchased from the Gerard family the manor of Aspull, and the right to the coals and minerals, and since that time the mines under different parts of the manor had been worked by Lord Balcarras. He considered also that he had a right to enter into the estate which now belonged to the devisees of Mr. Walker, and search for the canal under that land. Accordingly he entered, by his servants, in the year 1838, and there was an objection at first. Subsequently a Mr. Leigh, who acted as attorney for defendant, raised the question, and stated that though Lord Balcarras had a right under one of the leases called Pennington's, yet he had no right under the premises called Holmington's. An action was brought in the year 1839, but was not proceeded with. The works were continued, and compensation was made to the tenant for the trespass on the surface of the land. Notwithstanding this, however, the action was now proceeded with, and the jury were there to try Lord Balcarras' right to the land, for the declaration stated that the defendant broke and entered into the closes of the plaintiff. In the year 1878, Sir William Gerard, and his sons, Richard and Thomas Gerard, were seized in fee of the closes in question, and, being so seized, the mines and canal belonging to Richard and Thomas, they executed a deed to a person named John Anderson, by which they conveyed the surface of the land to him, but retained the coal and canal under the land to themselves. The replication of the plaintiff admitted the fact that Richard and Thomas were seized of the manor, but it denied the fact that they were seized of the coals in question, and the execution of the deed by which the lands were sold to Anderson, retaining the coals, minerals, and canal to Richard and Thomas, and the right to enter the land for the purpose of working the mines. It was a common thing for the minerals on an estate to be retained in a family, whilst the surface of the land passed to different parties, and this was the case in this instance. The Solicitor-General then read a quantity of documentary evidence, for the purpose of proving that the closes of Aspull had passed regularly down from the year 1678, when they were purchased by Anderson, till the present time, always reserving the right to the coals and minerals to the Gerard family, from whom it had been purchased by Lord Balcarras. He said the deed of 1678 was not in possession of the defendant, but they had given notice to the plaintiff to produce it, and if he did not, he (the Solicitor-General) apprehended he might put in evidence an attested copy, and this would be the point for his lordship to decide—the admissibility or inadmissibility of this document. The simple question, therefore, to be decided, was, whether they could prove the execution of the deed of 1678. The learned counsel then cited several cases to prove that copies of documents had been admitted as secondary evidence, in the absence of attesting witnesses or the document itself, and proceeded to call a number of witnesses. He also put in voluminous documentary evidence, consisting principally of title deeds of no interest but to the parties immediately concerned.

Mr. WENTLEY said he would not trouble the jury. His Lordship would decide the points of law for them, and he could not expect to alter the facts of the case.

The learned Judge said he would not trouble the jury except to return a verdict for the defendant. The evidence satisfied him that the clauses in question were the clauses in the deed of 1678, and the plaintiff would have the benefit of any legal objection by moving for a new trial.

ON KAKODYLIC ACID, AND THE SULPHURATES OF KAKODYL.—In the present paper Professor BACON examines the higher stages of oxidation of kakodyl, and the sulphurates corresponding to them. He finds that, by the oxidation of kakodyl, either by the direct action of the air, or by means of oxide of mercury, kakodylic acid is formed; but there is also an intermediate oxide, which cannot be obtained in a state of purity, which seems to be similar to the hypomuric acid, and to be a combination of kakodylic acid with the oxide. Kakodylic acid crystallises out of alcohol; its composition is $C^8 H^8 As^2 O^8$ —HO, this atom of water being constitutional, and only to be replaced by a base; it is soluble in water, but not in ether. A very remarkable fact with respect to this body is, that the poisonous properties of the arsenic seem totally annihilated; eight grains administered to a rabbit exerted no poisonous action. Kakodyl combines directly with sulphur, forming the proto-sulphuret which has been already described. This compound takes up another atom of sulphur, and produces the bisulphuret. There appears also to be a trisulphuret analogous to kakodylic acid; Professor BACON has not, however, been able to obtain it in a pure state. From the above results, it appears that kakodyl is perfectly similar in its behaviour to some simple metals, and the formation of kakodylic acid by direct oxidation is in exact opposition to Dr. BACON's theory of substitution.—Prof. BACON, *Trans. British Association*.

IMPROVEMENTS IN ROAD PAVING.—At a late meeting of the Farm Academy of Sciences, a communication was read, by M. Dumas, on a new system of paving roads. It is in principle similar to that of M. Adams, but, if we are correctly informed, presents an important amelioration. Upon the M. Adams principle the stones become soon pulverised, and in dry weather the traveller is hindered with dust, and in wet weather has to wade through a mass of mud. All this, says the paper in question, is avoided by the use of a newly invented roller, of such extraordinary power that the broken stones become a solid and compact body, as firm as a rock. We regret that M. Dumas has not given us such a description of this roller, which is the invention of a M. Schafferman, in would enable us to offer an opinion of its merits, for although M. Dumas states that the new system of road making has been applied with success in the town of Brest, we must be permitted to doubt the power of the newly-invented machine, not having the experiment, which is said to have been made, before our eyes.

PROCEEDINGS OF PUBLIC COMPANIES.

MIDLAND COUNTIES RAILWAY.

The annual meeting of the proprietors of this company was held at the station, at Derby, at twelve o'clock, on Saturday last; it was very numerously attended (and somewhat boisterous), and did not terminate until half-past five o'clock. T. DICKY, Esq., in the chair.

Mr. BELL (the secretary) read the advertisement convening the meeting, and after other preliminary business, Mr. MACAULEY read the directors' report.

REPORT.

From which it appeared that the gross receipts for traffic for the half-year were £4,007, 7s. 3d.—exceeding those of the corresponding period of 1841 by 7195, 13s. 10d.; and the balance on the revenue account in favour of the company was £18,767, 18s. 3d., which would enable the directors to declare a dividend of 11. 10s. per share, and 7s. 6d. per quarter-share for the half-year. The Act authorising the increase of capital had received the Royal Assent—one condition of which was, that the whole amount to be raised by shares should be subscribed for before the power to borrow can take effect—it was, therefore, necessary that new shares should be issued to the full amount authorised, but as the directors wished that the calls might be regulated by the wants of the company, they recommended a call of 2s. per share on 15,000 new shares which they propose to create, and which call would be sufficient for two years; the money, therefore, to be now raised would be as follows:—2s. per share on 15,000 new shares—£50,000 0 0
To be borrowed on debentures 50,000 0 0
To be borrowed on loan notes for three years 50,000 0 0

Total £150,000 0 0

The report concluded by announcing that the Act of Parliament for a junction line between the Great North of England Railway, at Darlington, and the Durham Junction Railway, had passed, and that active measures were in progress for the formation of the line.

A report from Mr. Kearsley (superintendent of the locomotive department), relative to some experiments which had been tried with Hall's apparatus for the substitution of coal for coke, was then read, in which, after describing the experiments with the *Rever* engine, he states that a great reduction of expenditure was evident, provided that the action of the fire and the great body of gaseous matter generated and ignited by the apparatus, and acting on the different parts of the boiler and engine cylinder to its effect, he is not prejudicial as to counteract the saving in fuel by increased wear and tear. The apparatus was, however, now being applied to the *Walf* engine, which would complete the matter with the *Rever*, and which would give unquestionable opportunity of testing the matter with the *Rever* engine; the cost with coal was £104, per mile, with coke 184s.; the repairs after coal were great, after coke only 17s. 1d. The use of coal, it appeared, also charged the tubes and fire-box, heated the pistons and machinery to such an extent as to prevent the necessary lubrication, and discharged such quantities of fire from the chimney as to endanger the safety of the goods—the stuffing-boxes also required re-packing almost every day.

The reading of this report caused a warm discussion.—Mr. HEYWORTH (of Liverpool) called attention to some glaring contradiction between the present and a former report of Mr. Kearsley's, but it appeared that, from the former report which had been circulated, several sentences had been omitted, which altered the sense completely, and that, altogether, it only related to the trials with the *Rever* engine, which were not considered to be satisfactory.—Mr. T. RAYBONE (of Liverpool) said the engineer of the London and Birmingham Railway was satisfied, from the nature of the machinery, and the great speed at which the engines travelled, Hall's apparatus could not be otherwise than unsuccessful.

On Mr. CAMERON moving the adoption of the report, Mr. HEYWORTH rose to make some observations on the present management, and the unsatisfactory results of the undertaking; his own family held one-twentieth of the concern, and he was there also as the representative of a large number of disappointed shareholders, who considered the line had cost a great deal more than the original estimate, and the small return for the money expended: it was time a searching investigation was made into their expenses. It was for the directors to enter into the minutiae, but he could name a few items where an alteration might be safely effected; the number of directors might be reduced from twenty-four to twelve—making a saving of 6000l. per annum; of policemen, from fifty-seven to forty, a saving of 1100l. per annum; a saving also in the maintenance of ways might be effected of 3000l. per annum; salaries might be fairly reduced, and offices abolished, to the amount of 1000l. per annum; he thought a total saving might be effected of 8000l. per annum.

A very lengthened and noisy discussion ensued, from which it was at length elicited that the salary of Mr. Bell, the secretary, was 800l. per annum, and the CHAIRMAN took upon himself the entire responsibility of the appointment, and he thought he had made a cheap bargain (ironical cheers).—From Mr. Heyworth's searching questions, it was also stated that Mr. Kearsley's salary had been raised from 3000l. to 6000l. a-year.—A very general cry was raised for the directors to retire, and the appointment of another board, but, after a very noisy debate, the directors having, through the chairman, pledged themselves to economy, their report was adopted, and the dividend made payable on the 1st September.—Notwithstanding the wish expressed for a reduction of the number of directors, on the proposal to re-elect those gentlemen who retired by rotation, the votes taken by ballot were—For the re-election, 2366, of which number 1970 were proxies; and against it, 802, of which 447 were proxies—thus leaving a majority in favour of the present number of directors of 1564.—A vote of thanks was passed to the chairman, and the meeting broke up.

[In connection with the above report, we may insert the following communication in reference to Mr. Kearsley's allusion to Mr. Samuel Hall's apparatus, in his report to the directors, and which letter was read by the chairman to the meeting:—

GENTLEMEN.—I have this moment, for the first time, seen a report of Mr. Joseph Kearsley, dated 9th instant, to the committee of management of the Midland Counties Railway. Mr. Kearsley's statement for not letting me see a copy of it, as he did on the occasion of his former report—viz., of 24 January—is obvious. I have not time before you meet this morning to say more than that I judge my word to prove, in due time, that the first-mentioned report is a tissue of most gross and incorrect statements, to use the mildest terms, and that it will prove a lasting monument of disgrace to the writer, both as a scientific man and as a householder. "Mighty is truth, and will prevail," so will ere long be shown in this case. I have only time to offer one argument in opposition to Mr. Kearsley's statements—viz., to repeat the offer contained in a circular addressed to you on 11th instant, to contract with me for the running of your trains at 20 per cent. less than the present cost of fuel, giving you the absolute necessity for the due performance of my contract. Requesting that this hurried letter may be read to the meeting now being held, I am, Gentlemen, yours, &c.

I am, Gentlemen, yours, &c.

DAVID HALL.]

GREAT WESTERN RAILWAY.

The half-yearly general meeting of this company was held at the terminus, Bristol, on Thursday, the 15th instant.

CHARLES RUSSELL, Esq., M.P., in the chair.

The CHAIRMAN said, the report which the directors had had the pleasure to lay before them that morning was so full on every point, that it would be unnecessary for him to detain the meeting with many observations. The receipts for traffic during the last half-year had not been quite so large as in the preceding one, but that was to be fully accounted for, by its being the winter half-year, in which the receipts never were so large, and by the depressed state of trade; he was, however, happy to say that their receipts would bear a comparison with those of any other railway in the kingdom. The directors were happy to say that they were enabled to declare a dividend upon the half-year of 3 per cent., and when they said that previous to doing so the whole of the interest had been paid, together with the rents to the Bristol and Exeter and Cheltenham and Great Western Union Railways, it could not fail to inspire him with increased confidence in the progressive success of their undertaking. Their own line being nearly finished, the attention of the directors had naturally been turned to the neighbouring railways, to which they might look for an increase of traffic, and he was happy to be enabled to say that the contract with the Bristol and Exeter Railway had proved satisfactory in every respect; that company also had been benefited by the connection, for it had enabled them to get over a period of pressure and difficulty, and had secured to them a solid proprietary. The line had been further opened to Taunton, and, in connection with that subject, their attention had been naturally drawn to the port for the departure of the West India mails. That matter remained nearly in the same state as at the period of their last meeting in London; there had, however, been no adverse decision of the Government, and they had had the advantage of receiving the recommendation of the commissioners, which, with the facilities afforded by the railway, he had no doubt but that a western port, in connection with the railway, must ultimately be chosen. The mails to the south of Ireland had also occupied their attention, upon which a committee had been appointed, with Lord Innes as its chairman; he had had the honour of attending with a deputation of the western Members, and he had no doubt that if the packets on this station were made more powerful, and certain passengers which were not the most pleasant were excluded, the Government would render them their aid for the conveyance of the mails. The chairman then went into the proposed negotiation with the Cheltenham Railway Company, and concluded by calling on the secretary to read the

REPORT.

The report stated that the gross receipts during the six months ending the 30th June, 1842, were £11,171, 2s. 6d., for the Great Western—£1,000,000, Cheltenham,

and Great Western Union, and the Bristol and Exeter. Of this sum £771, 12s. 6d. had been received on the Great Western Railway exclusively. The line having been only partially opened at the same period last year no perfect comparison could be made of the receipts. They were, however, only 107,771, 12s. 6d. for an average distance of about 100 miles, as contrasted with 273,271, 12s. 6d. for a distance of 114 miles. The falling off in revenue during the first six months of 1842 as compared with the last six months, was 34,400, 18s., which was accounted for by the different seasons. The number of passengers conveyed for the last half-year was 725,571. The conveyance of merchandise had increased during the last half-year, notwithstanding the general depression of trade, presenting an augmentation of 25,000 tons, and they felt that it would be necessary to proceed with caution in reducing their charges, but they should be loath to increase the carriage of goods for local purposes, for which there was no competition. The report referred particularly to the articles of stone and coal, and stated that measures had already been taken to improve the branch of traffic. The expenses for the past half-year had somewhat exceeded those of the preceding period, which was accounted for by the augmentation of the accommodations for the merchandise traffic, and by the expenses of the accident at Ronsing cutting. The maintenance of way had also been heavier, which was to be accounted for by the repairs necessary from the wet weather. The maintenance of way had now been less by 3s. 6d. per mile than in the last half-year, and the balance of interest on loans during the last half-year was 72,484, 1s. 7d.; this sum, with 1000l. to the Cheltenham and Great Western Union Railway Company, and 17,257, 6s. 11d. to the Bristol and Exeter Railway, being defrayed out of the general revenue account, a balance remained of £10,355, 1s. 8d. The directors declared a dividend of 3 per cent. for the half-year on the capital called up to be paid on the 1st of September next. This was the same dividend as that paid in March, and would amount to 20,700, leaving an undivided balance of 20,000, 1s. 8d. for the current half-year. The property tax for one-quarter of a year, from the 1st of April, would be deducted from the present dividend. A call of 2s. per share on the fifth of shares would be made in January next, to liquidate the debentures on loan notes then falling due. A report having been presented that an eminent geologist had given an opinion that the flux tunnel was insecure, the President of the Board of Trade had ordered an inspection of the tunnel by General Pender, Inspector-General of Railways, who had reported that it was perfectly secure. The report stated that the Cheltenham and Great Western Union Railway Company had obtained further powers from Parliament, which enabled them to treat for the purchase of the finished portion of the line, and for its completion. The directors had been in communication with that company, and were of opinion that the most desirable mode of obtaining a continuous line of railway from the Great Western to Cheltenham, as well as the traffic from South Wales, &c., would be by an undertaking on the part of the Great Western Company to lease the line at a fixed rental, when completed, for a stated number of years; and the report concluded by asking the proprietors to give their sanction to a negotiation with the Cheltenham Company being entered on for that purpose, the result to be submitted to a special meeting.

Mr. OYDEN rose to propose the adoption of the report, with the exception of the 3 per cent. dividend, in lieu of which he proposed that the reserved fund of 20,000l. should be abolished, and a dividend of 3½ per cent. declared. He did so because he thought it both hard and unjust that the present proprietors should be obliged to lay by a reserve fund for the benefit of future proprietors coming in seven or ten years' hence, while the original proprietors had remained for years without receiving any interest. The arguments in favour of the reserve fund were, that by the lapse of years such a depreciation of stock took place, that if its repair were all at once taken out of the receipts it would be injurious to the dividend. He would, however, contend that such a reserve fund was unjust, and experience was also greatly against it, for the Liverpool and Manchester Railway, which was one of the best managed in the kingdom, and which had been ten years in existence, had no reserve fund, and yet their dividends were 10 per cent. On the South-Western line, also, the opinion of the chairman had been taken, and had been decidedly against a reserve fund. He had emphatically said, that their rail had been in work four years, and yet their plant was more valuable than the first day—that they had gone on repairing, as it was needed, without waiting until articles were entirely worn out—that they needed no reserve fund—and that his successor, in ten years' time, would, he believed, have to tell the same tale.—The motion having been seconded, an amendment—viz., "That the report be adopted," was moved by Mr. W. ROSKILL, and a long debate ensued, after which the amendment was put and carried.—Resolutions declaratory of the dividend, empowering the directors to negotiate with the Cheltenham Company, and the usual resolutions of form, were then carried, and the meeting, which was at one period a very stormy one, broke up.

LONDON GRAND JUNCTION RAILWAY.

The half-yearly general meeting of the proprietors in this company was held on Monday, the 15th instant.

W. CASH, Esq., in the chair.

The clerk having read the advertisement convening the meeting, the CHAIRMAN said, as the intended operations of the company appeared now to be entirely at an end, the directors, of course, had nothing in the shape of a report to lay before the proprietors. They had prepared a short statement of the accounts, which the clerk would read, and which any proprietor could inspect.—From this statement of accounts it appeared, that, after payment of all outstanding claims upon the company, which amounted to 643, 11s. 11d., there was an available balance in favour of the proprietors of 3565, 17s.

A PROPRIETOR observed, that, as all claims of carrying out the railway had now ceased, and as all the powers of their Act of Parliament ceased in July next, he suggested whether it was not absolutely necessary on the part of the directors to take immediate steps for the dissolution of the company, and dividing the balance in hand among the unfortunate shareholders.—Mr. STETON (of the firm of Sweet, Sutton, and Co., solicitors to the company) said that he was not aware of any objection to such a course, and, if the matter was determined on, a special meeting must be called for the purpose.—After some conversation, it was arranged that the directors should call a special meeting, for the purpose of taking into consideration the immediate dissolution of the company, and the division of the assets, and that due notice of the same should be given by advertisement.—Thanks were then voted to the chairman, and the meeting separated.

MARYPORT AND CARLISLE RAILWAY.

The half-yearly general meeting of the shareholders in this undertaking was held at Aspathia, on Wednesday, the 10th instant.

F. L. B. DYKE, Esq., in the chair.

The usual preliminaries having been gone through, the SECRETARY read the directors' report, which stated that the progress of the works was in a most satisfactory condition, as would be seen by the engineer's report. The part of the line from Maryport to Aspathia continued to afford an increasing revenue, and yielded a fair return for the outlay. Another part, from Carlisle to Dalston, would be open in a short time, and that in the course of the spring the line would be through to Wigton, when a considerable traffic might be expected. That the passenger traffic exceeded what could have been expected; coaches from Carlisle to Whitehaven ran in connection with the railway; the arrangement being judicious and cheap, and a great accommodation to the public, and that it had been ascertained that coal might be sent to Carlisle, and all the intermediate places, from the coal-fields in the west, which particularly interested the proprietors in a speedy termination of the railway. That such rigid economy had been observed that the directors confidently declared it would be found the cheapest line in the kingdom, and that the directors look with confidence to the proprietors, and the public in general, to further the object in view as much as in their power.

The engineer's report was also read, which was very voluminous, and entered into all the details of the progress of the various contracts, which appeared perfectly satisfactory, and fully bore out the observations in the directors' report.—From the revenue account it appeared the total receipts for coal, passengers, passenger traffic, and goods, up to the 30th June last, amounted to 2007, 10s. 10d.; and the expenses, repairs of way, engines, waggons, &c., and interest of mortgage money, 7000, 15s. 11d.—showing a net profit of 2007, 10s. 10d. The sum already expended on the railway, and in the purchase of engines, carriages, waggons, &c., is 154,210, 15s. 6d.

On the motion of J. HARRIS, Esq., seconded by THOMAS FARRIS, Esq., the directors' report was unanimously adopted; and, on the motion of J. W. FLETCHER, Esq., seconded by GEORGE DALTON, Esq., the balance-sheet and accounts were approved and passed.—H. BARNHART, Esq., in consequence of declining health, having communicated his wish to resign the office of chairman and director, it was resolved—"That Mr. Dyke be requested to convey to Mr. Barnhart the great regret the proprietors feel at his retirement, and the great loss to the company, and to express the high esteem they entertain of the strict impartiality and untiring exertions by him while he held those offices."—The three directors who went out of office by rotation, Messrs. Hartley, George Cowen, and R. Tison, Esqs., were unanimously re-elected.—It was then resolved—"That John Stiel, Esq., be appointed auditor and investigating director, at a salary of 1000, 0s. per annum."—F. L. B. DYKE, Esq., was appointed chairman, in the room of F. L. B. Dyke, Esq.—Thanks were voted to Sir Wilfrid Lawson, Bart., for his invaluable services in forwarding the interests of the railway, and equipping the directors with money for purchasing iron at a time when it could be procured on advantageous terms.—The resolutions of thanks read out by the directors were confirmed, the usual thanks voted to the chairman, and the meeting, which was most comfortably attended, and among whom the greatest good feeling and satisfaction seemed to prevail, then broke up.

STOUBRIDGE AND RIDGEMOUNT BANKING COMPANY.

At the eighth annual general meeting of the proprietors of this company, held at the Queen's Hotel, Victoria Road, near St. Paul's Church, on the 20th inst., JAMES FLETCHER, Esq., in the chair, the annual report of the directors was read, from which it appeared that, after deducting all current

charges, a clear surplus profit of 10,999, 6s. 8d. remains on the liquidation of the year ending 30th June. After payment of the dividend of 10s. per share, in addition to the same amount paid on the half-year ending 31st December, 1841, the sum of 999, 6s. 8d. is carried to the guarantee fund, which now amounts to 14,919, 6s. 8d. The report concludes thus:—"Notwithstanding the great depression which has prevailed in almost every branch of trade during the past year, and the consequent diminution of individual transactions, the aggregate returns of this bank show a considerable increase over the preceding year, arising from an accession of new accounts. It is, therefore, very gratifying to the directors to be able to report a steady increase of safe and profitable business, and that they have no bad debts to write off for the past year."

INSURANCE COMPANIES—THE INCOME TAX.

The following very able paper, by Mr. John Wray, the chairman of the University Life Insurance Company, on the Income Tax payable by insurance offices, has been submitted to great authorities, and contains principles and illustrations as likely to be of general service, that we readily give it more extended publicity. It deals successively with the three classes of insurance societies—the mutual, the proprietary (or shareholders'), and the mixed; and concludes with a general addendum of great practical importance:

MUTUAL.—A mutual insurance society consists of persons who agree to contribute sums of money, according to their different ages, which, by calculations based upon the expectations of human life, are thought sufficient to secure to the subscribing parties, at their decease, a certain payment. After a given interval of years, a valuation of the liabilities and means having been made, it is found that the sums contributed have been larger than were necessary to secure the respective amounts payable after death. It is obvious that this surplus cannot be called profit, but only a contribution beyond that which was supposed to be required for a given object. The question then arises, in what manner this surplus shall be returned to the contributors; and this is usually done by giving an addition to the amount payable after death, or by diminishing the annual premium. For example, 100 persons agree to form a mutual insurance society, each person assuring 1000l., the rate of premium being according to their respective ages. In order to be perfectly safe, and to guard against every possible contingency, they agree that the rates of premium shall be 30 per cent. higher than the ordinary tables of mortality would appear to require. At the end of ten years, it is found that the sum necessary to meet the liabilities of the society is less than the accumulated fund. A calculation is then made as to the amount which the surplus fund would give, by way of addition to the sum assured. This has in general been called the bonus, but it cannot in any way be construed into profit; it is nothing more than a deposit for the sake of additional security, to guard against unforeseen contingencies. Now, if this accumulation of money had been looked up in the coffers of the society, each party would have to receive back only his proportion of over payment; but as it will probably have been invested in the public funds or upon mortgage, it becomes liable to any tax which may be imposed by Parliament upon the income arising out of property so invested.

SHAREHOLDERS.—The case of a society formed of shareholders only, who keep the whole of their profits for their own benefit, is quite different. They may be said to be dealers in human life. They are associated together for the purposes of profit. They agree to secure to parties assuring with them a fixed sum payable on their decease; and, if, at the termination of a certain number of years, they find themselves in possession of a surplus beyond their engagement, or, in other words, exceeding the value of the assurances to which they are liable, "that constitutes their profit." It becomes divisible among the partners in the trade, and is just as liable to be assessed to the income tax as if they were common merchants. For example, if in five years the surplus amounted to 20,000l., the income tax would be payable upon 4000l. a-year, being the average profit of the last five years over and above any interest derived from investments.

MIXED SOCIETIES.—In mixed societies, where the shareholders are only entitled to a certain portion of the surplus fund, they are only liable to pay upon that portion. For instance, when nine-tenths of the surplus contribution belong to the assured, and one-tenth to the shareholder, the society is liable to make an annual payment upon the one-tenth of the surplus divided by the number of years which intervenes between each valuation; for instance, at the end of five years, the accumulated fund or surplus being found to be 50,000l., the profit to the shareholder would be 6000l., and the annual payment to the income tax would be upon 1200l. a-year. If the capital originally subscribed by the shareholders be invested in the funds, the income tax will have been deducted, but if any per centage be allowed over and above what is really produced by the funds, then a tax will become chargeable upon the difference. For instance, the subscribed capital being 50,000l. upon 100 shares, and invested in the 3 per cent. stock, the income tax will be deducted upon that amount of interest; but if the interest allowed to shareholders be 5 per cent., then the tax must be paid upon the difference—viz., 1½ per cent., that sum being taken by them in addition to their share of surplus divisible between the assured and the shareholder.

GENERAL ADDENDUM.—In all cases when the amount of investment belonging to any society, either in the funds or in other securities already charged with the income tax, is equal to, or exceeds, the estimated amount of profits, nothing is payable either on profit or dividend on shares."

RAILWAY PROPERTY.—The pressure which has of late been so severely felt in all commercial transactions, has not, it appears, passed by this description of investment. At the meeting of the Sheffield and Rotherham Railway, on Monday last, the chairman stated that he had, from official sources, the following diminution in the receipts from railway traffic for the past half-year, as compared with the corresponding half-year in 1841:—

Birmingham and Gloucester had fallen £ 812 per week
Glasgow and Greenock 70
Great Junction 70
Liverpool and Manchester 1000

and that, taking the average of all the northern railways, a similar falling off had taken place.

PREVENTION OF RAILWAY ACCIDENTS.—(From a Correspondent).—In consequence of the many and fatal accidents arising from the breaking of railways upon railways, a scientific gentleman in Paris has applied his judgment to their prevention, and the result of his ingenuity is an arrangement, patented in this country, which appears fully to meet the humane and important object in view. It is so constructed, that should the axle be broken, or in any way displaced, the carriage may still proceed upon its journey. It is really a very simple and ingenious contrivance, and we are indebted to Messrs. Louis, of Marguery-street, Cavendish-square, for an inspection of it. These gentlemen must the inquiry of the scientific and curious, who may be afforded the means of personally seeing themselves of its merits. Should this contrivance prove to be one which can, if adopted, prevent the frightful loss of life and mutilation of limb which have thrown such a gloom over society of late, it will, indeed, confer high honours upon the inventor.

THE DIVING-BELL.—DR. PAYEN.—The new (now patented) process of Dr. Payen, of supplying oxygen for respiration under water, without the cumbersome attachment of air pump, pipes, &c., is well worthy the attention of scientific men, and more particularly those connected with submarine operations. The Doctor has lately been making a number of experiments in a diving-bell at the West India Docks, accompanied on every occasion either by an engineer of the company, or by some of the divers usually employed by them, and he has succeeded to the satisfaction of all present, not only in supplying a respirable and pure atmosphere in the bell, but of obtaining sufficient pressure to restrain the water from rising to an inconvenient height as it descends to great depths. To show its complete success, it is worthy of notice that, during the last experiment, when four parties descended, the small apparatus which is employed, was kept from working for five minutes, when a dense vapour filled the bell, and great difficulty of respiration was experienced; the machine was then employed, and, in thirty seconds, the vapour was dissipated, and the air rendered pure. The extent of confidence to which this principle may be applied in mining, well digging, and all sub-terrestrial, as well as sub-aquatic operations, has yet to be seen.

METALLIC BALLS.—La Presse states, that M. Lathuier, an ingenious mechanic of Strasbourg, is about to construct a ball of metal, which he expects to guide as he pleases. For this purpose a subscription has been raised sufficient to cover the expense of such a machine. This steam-bell, which is in progress of construction, may consist from three to fifty persons, with provisions for fifteen days. Every precaution has been taken to prevent the possibility of accident from fire, explosion, or want of gas, and even should the ball fall into the sea its construction is such that it may continue to proceed through the water as rapidly as a stone-boat. As an ordinary ball of iron weighs 1000 lbs. in twenty-four hours, the rapidity of a steam-bell, whose wheel, driven by an Archimedes screw, will describe at each rotation a space of seven yards, must be considerably greater. Several skilful engineers, who examined this machine, have no doubt of the possibility of completing this new mode of transport, which travellers will render useless high roads and railroads. The only difficulty (?) will be where to place the custom-house.

PUBLIC COMPANIES.

SHARES.	
Clarence Railway Company	George and Vulture Aug. 23 11-12
Taff Vale Railway Company	Office, Glasgow, 23 1
Edinburgh and Glasgow Railway	Office, Glasgow, 23 1
Barrow and Furness Railway	Office, Barrow, 23 1
Van Dyke's Land Company	10, Old Broad-street, 23 1
Irish Waste Land Improvement	King's Head Tavern, 23 1
North Midland Railway	St. John's, Derby, 23 1
Stratford and Epsom Railway	White Lion Hotel, Stratford, 23 1
Devonshire and Exeter Railway	King's Head, Exeter, 23 1
Bradford and Thirsk Railway Co.	Graveyard, 23 1
St. George's Steam-Packet Co.	Clarence Dock, Liverpool, 23 1
Hull and Selby Railway Co.	Town Hall, Hull, 23 1
London and South-Western Rwy.	Nine Elms, Vanhall, 23 1
Rio de Janeiro and Brazil Rwy.	George and Vulture Tavern, 23 1
Great North of England Railway	Office, Darlington, 23 1
Paris and Rouen Railway	St. Rue de la Victoire, Paris, 23 1
General Steam Navigation Co.	8, Lombard-street, 23 1
Traffic Mining Company	8, Midland-street, 23 1
Hayle Railway Company	Office, 23 1
CALLS.	
Trigon Mining Company	25, per share Aug. 20, 1882, 23 1
DIVIDENDS.	
London and Brighton Railway	10s. per share, Office, 23 1
Chamberlain Union Bank	10s. per cent, Bank, 23 1
Astoria, Blythe, and Co.	10s. per cent, Bank, 23 1
Widow's Copper Mining Co.	12s. per cent, 11, Ormond-street, Dublin, 23 1
Birmingham and Midland Bank	4s. per cent, Bank, 23 1
London and Westminster Bank	5s. per cent, Bank, 23 1
North and Eastern Railway	10s. per share, 23 1

NOTICES TO CORRESPONDENTS.

Our Correspondents and Subscribers are informed, that the business of the Mining Journal will henceforth be conducted at No. 1, Cannon-street, Fleet-street, where letters addressed to the Editor will meet attention. All advertisements and communications are requested to be forwarded to the above address.

"T. B. (London).—Copies of registered lists of shareholders in any of the joint-stock banks may be procured, for a nominal charge, on application at the Stamp and Tax department at Somerset House—would that such was the case with insurance companies.

Professor Vignoles's Lectures on Civil Engineering.—A few perfect sets of these Numbers of the Journal containing the lectures of Mr. Vignoles have been made up, and can be had at the office, 1, Cannon-street, Fleet-street.

"H. W. (London).—The subject was noticed in the Journal a few weeks since.

Past-Office Delivery.—We continue to receive repeated complaints from our readers to whom the Journal is addressed direct from this office, as well as through agents, of the irregular delivery of the Journal. For ourselves, we can only say, that the fault lies not with us, and the strict punctuality usually observed by news agents, leads us to conclude that the blame rests alone with the Post-office. We shall be glad to receive communications at all times from our subscribers whose neglect arises.

"E. P." is informed, in reply to his letter, dated "Hitham," that the publication referred to has been discontinued for the present.

THE MINING JOURNAL,
Railway and Commercial Gazette.

LONDON, AUGUST 20, 1882.

The advantages contemplated from the use of coal in locomotive-engines on railways, by the application of HALL'S, CHANTER'S, or other patents, which have been taken out with this object, have induced us to direct our attention to the subject; and, in addition to personal inquiries and investigation, we have availed ourselves of all information to be derived, either directly transmitted by correspondents, or from the columns of our contemporaries. Within the past two or three weeks the merits of the patent taken out by Mr. SAMUEL HALL have been discussed in our columns, but not considering the question at issue sufficiently ripe to call for any observation on our part, and anxious to hear both sides, we avoided any notice, other than that attracted by the insertion of the letters—but, inasmuch that the question has now assumed a different feature, arising from the report of Mr. KEARSELY, the superintendent of the locomotive department of the Midland Counties Railway, presented at the meeting of proprietors, held on the 13th inst., we cannot allow a week to pass by without offering some observations on the report of that gentleman, and the caustic reply, or notice, of Mr. SAMUEL HALL. It will be necessary to follow closely the statements put forward within the past few weeks; and as the discussion arose, in a great measure, from a paragraph which appeared in our columns on the 6th instant, we here revert to it.

The statement made was to the effect, that the working of locomotive-engines on the Midland Counties line with coke costs more than 170 per cent. that of coal—the *Walf* locomotive-engine, with Mr. HALL's patent apparatus, which went to work in May last, having run a distance of 1024 miles—the average consumption of coal being 56 lbs. 10 os. per mile—the cost of coal being 7s. 11d. per ton; while the average consumption of coke, in running 1310 miles, was 65 lbs. 4 os. per mile, at the cost of 30s. per ton of coke.

This assertion called forth a denunciation on the part of "A Railway Director," who, in a letter addressed the Editor, in which he most unfairly draws a deduction, and which the facts by no means warrant, says that the consumption in the best engine is at present not more than 33 lbs. per mile, and, hence, the working of the *Walf* is not attended with the advantages held out, while he omits to notice the comparative quantities of coal and coke used with the same engine—indeed, he might equally apply his observations to the comparative powers of the engines of Cornwall, noticed in our present Number, where he will find the average duty to differ very materially. We do not, for a moment, doubt but that locomotives are worked with 33 lbs., or even 15 lbs. of coke to the mile, but to arrive at a fair result we must apply coal and coke to the same engine, for if that in which coal is employed be the worst of its class, and that used as an illustration, where coke is the material, be of the best description, the comparison is most unfair. We do not pretend to follow the writer in his observations on the "chemical combinations," for we are, in common with shareholders in railways, "matter-of-fact men," and look to the results as a matter of pounds, shillings, and pence, the object being to arrive at correct data as regards the economy in fuel, and, next, the consideration, whether, by economising fuel, we do not subject ourselves to other costs, as wear and tear, by any destructive properties inherent in the application of the raw material. Such are the real questions to be considered, and it is with the object of examining the evidence put forward pro and con, that we are led to enter on the subject, and devote to it more than ordinary space.

We are then told by "A Railway Director," that one objection to the use of coal—and that a serious one, if the premises be correct—is the difficulty of obtaining coal sufficiently free from sulphur, to avoid the injurious and destructive effects upon the boiler tubes and copper fire-boxes of the boiler, as the chemical combinations which sulphur forms, with the other constituents of coal at high temperatures, produce destructive effects on those metals. The next of the series is that of a letter from "A Railway Proprietor," who, as a holder of shares in the Midland Counties Railway, expresses his satisfaction on the observations first quoted, and offers some comments on those of "A Railway Director." This gentleman corroborates fully the correctness of the opinions we have expressed, as to the palpable unfairness of the deductions drawn by "A Railway Director," who, he observes, "is not candid in speaking of the saving effected by the use of coal with the *Walf* engine, for, although that engine uses the great quantity of 56 lbs. 10 os. of coal per mile, and 65 lbs. 4 os. of coke, he must be aware that the *Walf* engine consumes only 30 lbs. 13 os. of coal, and 31 lbs. of coke per mile, so that the comparative economy produced by the use of coal is much about the same in both engines." He further adds, that the *Walf* was not selected by Mr. HALL, but by the Midland Counties engineers. Thus, it will be seen, the report of the performance of the *Walf* takes the sting out of the weapon

production of "A Railway Director." It does not, however, stop here, for, so far as our evidence at present goes, it is clear that the quantity of coal used does not exceed that of coke, while the difference in cost is as 7s. 11d. per ton on the former to 30s. per ton on the latter—no trifling consideration, and which, we believe, will be admitted, both by directors and proprietors.

Without entering into the chemical combustion and affinities as regards the injurious effects produced on the boiler tubes and copper fire-boxes by the use of coal, we are content in taking the reference made, by "A Railway Proprietor," to the Leicester and Swannington, and other lines of railway where coal is used instead of coke, and where, our correspondent states, on information he has received, "the copper tubes last three times as long with the use of coal as they do with that of coke." We are perfectly aware that much depends—indeed, everything—on the nature and quality of the coal used, as, in some districts, a sweet coal or coke is to be obtained, while, in others, it is so charged with sulphur as to afford no fair comparison. To this letter a rejoinder on the part of "A Railway Director" appeared under date the 12th inst., in which he states that he is given to understand "there is no doubt now, after a long-continued trial, that the injury arising from the use of coal is greater than the saving effected in the cost of fuel," thus, in some measure, anticipating Mr. KEARSELY's report, of the contents of which it appears the patentee was ignorant at that moment. The paragraph which immediately follows we confess we cannot comprehend; the writer says—"Nothing but experiment can determine this point, and I only contend against the absurd folly which would advocate the adoption of any new and doubtful invention, until sufficient experiments have been made on a small scale to test its value." The value of the opinion thus given, as we have already said, we cannot comprehend. We are first told that after a long-continued trial on a practical working, and large scale, the patent is found to be impotent, and yet the writer contends that experiments on a small scale should be made to test its value.

We here leave the correspondence, and proceed at once to the report of Mr. KEARSELY, which involves a question of so much importance to the railway interest—negated, as are the assertions contained in such report by Mr. HALL, as also by Mr. W. SMITH (whose letter will be found in another column), as well as the circumstance, as we are advised, that the London and Birmingham Railway contemplate the application of HALL's patent, that we feel it due to the railway proprietor, as well as the patentee, to direct special attention to the prominent parts of the report referred to. Before entering on the report, we may, however, here observe, that if, on the Midland Counties Railway, coal costs but 7s. 11d. per ton, the question becomes one of paramount importance to those districts which possess not the advantages obtained from coal-fields, the advantage of cheap fuel is secured—as, for instance, the London and Brighton line, the Eastern Counties, the South-Western, and others which we might readily cite.

Mr. KEARSELY, in his report, refers to that given by him in January last, wherein he stated that the result of the experiments made with Mr. HALL's apparatus was "a great reduction of expenditure from the use of coal," the report so made, however, being guarded by the following words:—"Provided the action of the fire, and the great body of gaseous matter generated and ignited by the apparatus on the different parts of the boiler and engine exposed to it, be not so prejudicial as to counteract the saving in fuel by increased wear and tear." In the report submitted by Mr. KEARSELY at the meeting held on the 13th instant, that gentleman observes, that, having applied the apparatus to the *Walf* engine, he had tested its merits by running it 1500 miles, at the rate of 100 miles a day, the average expense with coal being 124d. per mile. "The rapidly destructive effect of the flame from the coal (says Mr. KEARSELY) caused a delay of several days, not only during the experiment, but afterwards, before the engine could proceed to work with coke." The necessary repairs having been completed, the engine was again placed on precisely the same duty as in the experiment with coal, coke being used on the second occasion, when it was found that the cost per mile, including coke consumed, driver's wages, repairs, and other expenses, was only 101d. The cost of repairs, he adds, "after the use of coal, was great—after the use of coke only 17s. 1d." Mr. KEARSELY proceeds to note other objections, which he considers of an important nature, from the tendency arising from the use of coal, not only to the great injury and depreciation of the engine, but to serious accidents, to which there is a constant liability, and further observes, that the consumption of coal in trials made on the North Midland Railway was 25 per cent. over that of coke. The following extract from the report so forcibly expresses the opinions entertained by Mr. KEARSELY, that we here quote the words:—

With these facts before me, elicited by my own experience, and confirmed by the experience of others, I must certainly recommend you to proceed further in a project so dangerously uncertain in its results, and which would entail constant expense without any prospect of eventual good, with a certainty of requiring a much larger number of engines to do the same quantity of work. . . . I conclude by reiterating what I expressed to you twelve months ago, when this subject was first mentioned—viz., that "coal cannot be advantageously used as fuel in locomotive-engines, under their present construction," and "running at the high speeds required on the railways of the present day."

We learn further, from the report of the proceedings at the meeting, that Mr. T. RATHBONE (of Liverpool) stated it to have been the intention of the engineer on the London and Birmingham line to have been present, but who was prevented by illness. That gentleman, said Mr. R., whose experience and judgment was great, had stated that from the nature of the machinery, and the high speed at which the engines travelled, Mr. HALL's apparatus could not be otherwise than unsuccessful. We notice this assertion, because we are informed, on good authority, that the application of HALL's patent is contemplated on the London and Birmingham line.

Having given an outline of the report of Mr. KEARSELY, we now arrive at the letter of Mr. SAMUEL HALL, noticed in our early remarks, in which he observes, that up to the day on which the meeting was held, he had not seen a copy of the report, as on the former occasion in January last, Mr. HALL, who writes with evidently excited feelings, states that the report "is a tissue of most garbled and incorrect statements, to use the mildest terms, and that it will prove a lasting monument of shame to the writer, both as a scientific man, and as an honorable man." It remains now for Mr. HALL to show that he was warranted in thus applying language of so strong a nature to Mr. KEARSELY, who, in his official capacity as superintendent of the locomotive department of the Midland Counties Railway, thus calmly and dispassionately expresses the opinion at which he has arrived, and who, moreover, brings forward figures as evidence confirmatory of the opinions so entertained. If that his figures be the result of experiment, founded on correct data, then Mr. HALL will find his task one of difficulty; but, on the other hand, if that, as we apprehend, assumptions are constructed into facts, then will his office be equally easy.

The offer conveyed in Mr. HALL's letter (which it appears he has before made to the directors), of entering into a contract to run the trains at 20 per cent. less than the present cost of fuel, giving perfect security for the due performance of the contract, we think the directors would, at all events, do well to accept, and thus have one-fifth of their expenditure in fuel, in being underbilled in any agreement which might be entered into that the wear and tear did not exceed that to which they are at present subjected by the use of coke. The next, and last letter, to which we have occasion to refer, is that of Mr. W. SMITH (of Manchester), who quotes the report of Mr. KEARSELY, in which the latter states,

that "the Manchester and Leeds Company have made a similar trial, but with such unsatisfactory results as to cause them to abandon it also," meets the assertion by declaring it to be "a most gratuitous falsehood." We must, however, refer our readers to the letter, as well as those others to which we have made reference.

In closing our remarks on the subject, which we have treated on at greater length than is our usual practice, except in cases like the present, which we deem of no ordinary importance, we cannot but express our hope that Mr. HALL will be able to refute the statements put forward, and that the railway proprietor may be benefited by the patent in the use of coal instead of coke, whereby economy may be effected, and dividends increased, or fares lowered. The question will excite interest, and we can only express our earnest desire to lend our aid in any inquiry that may be undertaken—to promote which our columns will be found open to correspondence.

REVIEWS.

An Experimental Inquiry into the Advantages attending the Use of Cylindrical Wheels on Railways, &c. By W. J. MACQUORN RANKINE, C.E. R. Grant and Son, Edinburgh.

The object of the pamphlet under notice is, to use the author's words, "to describe a simple and practical method of removing a source of inconvenience, expense, and danger in the use of railways," and which consists simply of the use of cylindrical instead of conical wheels, the latter being used on all railways, with one exception, to which we shall have hereafter occasion to refer. To enable the railway carriage or locomotive to pass with ease round curves, the wheels are made of a slightly conical form in the tire, so as to enable them, by shifting spontaneously to one side or the other, to present thereby a larger diameter of wheel to the outer rail so to adapt themselves to different curvilinear tracks. In comparing the conical with the cylindrical wheel, the author states that by the continued oscillation of the carriages from side to side, describing in reality a series of small curves, this vibratory motion generates a resistance which increases with the velocity, and is so great that the power required to draw a load on straight lines and on curves is nearly the same, and is more than double the power which draws the same load on a straight line with cylindrical wheels. This is one of the objections raised by the author to the use of conical wheels, in addition to which he remarks that the oscillation of the carriages renders them liable to be thrown off the rails by a very slight obstruction or irregularity, and has, undoubtedly, been the cause of serious accidents; it also gives rise to a series of lateral shocks, which tend greatly to increase the wear of the track carriages and machinery; it is further disagreeable and inconvenient to passengers, of which we have ourselves had frequent practical experience; and Mr. Rankine adds, that "conical wheels, from the unequal pressure and friction upon different parts of their surface, become worn into irregular shapes, and are soon unsuited, alike for curves and straight lines."

With respect to cylindrical wheels, we are told that they possess none of these defects—"the motion of carriages running upon them is, when the track is in good order, perfectly steady at all velocities, and quite free from lateral oscillation; the saving of power which their use effects on straight lines amounts to about one-half the resistance of the same load upon conical wheels, and their greater safety and durability are necessary consequences of the first-mentioned advantage." The author proceeds to observe, that the advantages possessed by cylindrical over conical wheels is known to every engineer, but an opinion has hitherto prevailed that it is not possible to make them pass easily round curves, which appears to be the only obstacle to their general introduction. The experiments made on the Edinburgh and Dalkeith Railway, where none but cylindrical wheels are used, however, convinced the author of the error of the opinion so formed. This line is worked with horses, and although not originally intended for passenger traffic, now carries from 250,000 to 300,000 annually. It is described as being by no means well suited for obtaining the minimum resistance to draught, for its surface is much disturbed by the falling in of coal wastes beneath; and it is so indirect in its course, that, in a distance of seven miles and a half, there are as many as twelve curves of radii, less than half a mile, and several of them less than one-eighth of a mile. It is, therefore, fair to presume that, on railways better constructed, the advantages will be considerably increased. Mr. Rankine thus describes the line, and application of cylindrical wheels:—

The curves on this railway were originally laid out as to have an elevation of the outer rail above the inner, sufficient to counteract the centrifugal force at the low velocity used, but still quite inadequate to prevent the flanges of the cylindrical wheels from rubbing against the outer rails with such force as to render or quadruple the resistance. Instead of laying aside cylindrical for conical wheels, however, it was determined to adapt the track of the curve to the use of the former, by increasing the elevation of the outer rail, but as it would have been hazardous to undergo the expense and inconvenience of such an alteration without first ascertaining how it was likely to work, the improvement had to be put off until a suitable opportunity for making experiments presented itself, which did not occur until the year 1857, when a branch railway was being carried to the harbour of Leith. The elevation of the outer rail of some of the curves on this branch was adjusted by trial, until carriages with cylindrical wheels passed round with smoothness and ease, and without any tendency of the flanges to graze either rail. With the assistance of the theoretical investigation contained in the second section of this essay, a general rule for the adaptation of curves to cylindrical wheels has been deduced from those experiments, and nearly all the curves on the Edinburgh and Dalkeith Railway have been adjusted accordingly. The result has been an unequalled smoothness of motion and ease of draught, as the experiments detailed in the third section of this essay prove. Such is an outline of the inquiry, the details of which are given in the sequel.

We have then given an outline of the object of the work, and would willingly pursue the subject further, but as the essay, or inquiry, will doubtless find its way into the hands of every railway engineer, who will be able to test the several calculations embodied in the series of papers, we deem it unnecessary to do more than generally to note the several points treated upon, and which, to be clearly understood, require the assistance afforded by the tabular matter accompanying the inquiries instituted, and become also necessary as a proof of the correctness of the opinions entertained by the author. The second section consists of a theoretical investigation of the rule for the adaptation of curves to the use of cylindrical wheels, and explanation of its application to practice, which, we need hardly say, forms the main feature of the "Inquiry." To ascertain the proper elevation of the outer rail in curved lines for different radii, in the first instance a series of experiments were made with that object, but to connect those experiments, so as to obtain a general rule applicable to all cases, it became necessary to use mathematical analysis, the results of which are given. The account of experiments on the resistance of railway carriages with cylindrical wheels is in itself an important document, and the fourth, or concluding, section, on the effects of the use of cylindrical wheels on railways, and their advantages, as compared with conical wheels, is written in a very clear and comprehensive manner. The closing observations we deem of so much importance, and deserving the attention of the Board of Trade and Railway Commissioners, as well as directors and proprietors of railways, that we are induced to quote them:—

The saving of power effected by using cylindrical wheels, however, is a minor advantage, in comparison with their superiority over conical wheels in point of safety. It is well known that locomotive engines moving at a high speed are liable to be thrown off the rails by trifling obstructions; and, indeed, that their momentum leap off spontaneously, without having met with any obstacle that can be detected. This evidently arises from the circumstance, that a carriage, and especially a locomotive engine, with conical wheels, never moves straight forwards but for an instant at a time, so that whenever a small accidental obstruction or an increase of speed beyond a certain limit causes it to leap higher than the depth of the flanges, it is almost certain to light off the track. This source of danger, which has been the cause of many accidents, is entirely removed by the use of cylindrical wheels. I am particularly able to produce a remarkable proof of this fact, in an accident described in a paper which I some time since laid before the Institution of Civil Engineers. This long railway was running on the summit of an incline of 1 in 100, and was carrying a load of 100 tons of iron, and was being hauled by a single engine, which was a high country which it was impossible to estimate exactly. They met with no obstruction until they reached the bottom of the plane, where a three-foot plank, which they were then passing, for the purpose of throwing them off, they all leapt over the plane as a consequence, and a single engine, on the rails beyond it, continued their course at a velocity of about twenty miles an hour. This circumstance is attributable nearly to the use of cylindrical wheels, and, remarkable as it may appear, is only one out of innumerable instances in which carriages have leapt over crests and other obstructions without being thrown off the rails.

From the above extracts, and the brief notice we have taken of this useful and important Treatise, we cannot doubt but that all interested in the security of life and economy of working lines of railway, will further investigate the matter, and that they will not allow themselves to be prejudiced from us doing by any unfounded prejudices. The results given appear highly satisfactory, and that they are correct, the high character of the author must be considered sufficient evidence.

ON THE MANUFACTURE OF CAST-IRON

* Mr. Hart's last paper, "On the Transformation of Cu_2O into Cu_2S " is the subject of the end of the book.

[The two conversations are over.]

ON THE COMPARATIVE EXPENSE OF BRINGING COAL TO THE PIT
BOTTOM IN SRAMS INCLINED AT TEN AND THIRTY DEGREES.

Figure 1. The effect of the concentration of the polymer on the gelation time.

1. Case of ten diggers.—Fig. 1.—Two hours travel along the level from M to C, a distance of 172 metres, and east per day, including the wages to the driver and the stable man, fifteen francs. The level along which the carriers travel has a length of 135 metres. A harrier is requisite for 4800 metres of this length. The ascending road has a length of 450 metres. A harrier is requisite for each 135 metres of this length. There are counted, then, on an average, 150 harriers for the

A few weeks ago we published a letter addressed by Mr. E. Chalksworth

THE MINES OF PRUSSIA

PREPARATION OF CHLORIDE OF ZINC.—Take pure crystallized chloride of barium, 80 gram.; pure sulphate of zinc, 98.6 gram.; pure distilled water, 1500 ccm. Divide the 1500 of water into two parts, dis-

ON A NEW PARAFFIN OBTAINED FROM COAL NAPHTHA.—The substance described was obtained in the course of some investigations on an oil which Mr. Leigh discovered about three years and a half ago, as the result of a mixture of nitric and sulphuric acids on purified coal naphtha. In their character with potassa, both in aqueous and alcoholic solution, the crystals now brought under notice of the section by Mr. Leigh have much analogy with the oil (like that of silver aluminide) obtained at the same time with them. The oil when extensively exposed to the action of oxygen becomes a crystalline solid, having much the same appearance as these crystals. It is probable the crystals differ from the oil in containing a small quantity of oxygen. Mr. Leigh has made an analysis of these compounds.

Mr. LEIGH, *Franciscan British Association*.

9. Significant experiments have been made upon the growth of *Phaseolus vulgaris* L. in the presence of a strong flow of air, and the results are given in Table I. It is seen that the growth of the plant is not inhibited by the flow of air, and that the growth is actually increased. This is due to the fact that the flow of air increases the rate of transpiration, and thus increases the rate of absorption of water and mineral salts. The results of these experiments are in agreement with those of other workers, who have shown that the growth of plants is increased by the flow of air.

MINING CORRESPONDENCE.

FOREIGN MINES.

UNITED MEXICAN MINING ASSOCIATION.

Guamaca, June 17.—I beg leave to refer to the enclosed duplicate of my last letter, dated at the city of Mexico, the 1st inst., and, at the same time, to hand to you herewith the following documents in original, &c.:

Mine of Reyes and New Contract.—By subsequent letters from me the court will have been informed that not only the balance of \$1456 1/4 due to the association, as profits of the mine in the 31st December last, but also that all future similar profits, after becoming divisible, have been received by the association, in pursuance to the terms of agreement existing between the mine owners and the company, and dated the 20th January last. The profits of the mine for the four weeks ending the 21st ult., were, as stated in my letter of the 1st inst., \$14,011 3/4, and, during my absence from here, the portion thereof—say, \$7981 3/4—corresponding to the 134 bars mortgaged to the association, was punctually received by Mr. G. R. Glennie, in virtue of the power of attorney, and instructions left him by me for that purpose. The various productive workings of the mine, and the sales for its sole account, and those on joint account with business, have continued to give the same results up to last week, as compared with the preceding month; but, since then, a falling off in quality is visible in the ore on joint account with the business, which it is expected will produce a corresponding effect on the amount of sales now going on at the mine. In other respects there is nothing new or interesting in the mine worthy of notice here, except that the profits divisible to-morrow already amount, for the three weeks ending the 11th inst., to \$7226 2/5, and, with the present week's produce, may reach about \$12,000. With reference to the subject of a new contract, nothing whatever has transpired since the date of my last letter to the court.

Remittances.—The next Tampico conducta will leave hence in about a month, and by it I purpose remitting to the directors such amount of funds as can then be spared from my ways and means. J. N. SHOOLBRED.

BOLANOS MINING COMPANY.

Zanatecas District, May 28.—**San Clemente.**—The sinking of San German shaft, as proposed in my letter of last month, has been carried into effect, and its depth below La Luz level is now 10-51 varas, which is found sufficient for the purposes of containing the accumulated water from this part of the mine by night, and with one malacote only by day, with eight hours at present employed on the drainage. San Fernando level, driving west on the Buen Suceso vein, is still poor, although the plants of late have a little improved, and some stones from a branch, about four inches wide, have assayed 5 marcos per mouton; the whole width of the vein is about one and a half varas, composed of quartz and bronze calderas. About a fortnight since we commenced driving the same level west on San Clemente vein to make trial of the ground below some workings at La Luz level, near the Guardia Raja; a part of these workings was sometime since abandoned at about the depth of eight varas below La Luz, on account of the low ley of the ore, and a waste called San Silvestre, still sinking about eight varas further north, near the junction of San Clemente and San Juan, continues to produce an inferior kind of ore in tolerable large quantities, two paradises having broken 107 cargas in the month, and the vein is wide and promising. The La Luz level, driving east of San German, has been extended seven varas during the month, and, in that distance, two rather large boughs have been met with, one of which measured two varas high, two and a half long, and three-quarters wide; the vein, however, preserves its usual width of one and a half varas, and, though poor, contains bronzes of inferior quality. In El Carmen vein the vein varies from one-quarter to one-third varas wide, hard ground, and but little ore; the extraction during the month has been confined chiefly to the labor above San Antonio level; there are at present nine paradises employed; the key about seventeen marcos per mouton. Total quantity raised, including 357 cargas cleared from the Terrore, amounts to 998 cgs. 6 ar.

San Nicolas.—The shaft having reached a depth corresponding with the level of San Francisco, the sinking was suspended, and a cross-cut commenced driving north from the bottom of the shaft, for the purpose of cutting the vein; but, on reconsideration, it has been thought more prudent first to continue the Dios nos Gave cross-cut further north, which will be commenced next week. The vein in San Francisco continued very promising and productive until about the middle part of last week, and the first four varas driven in the month produced 130 cargas of ore of good quality; at the time above-mentioned, a vein about one-half varas wide, underlying a little south, crossed obliquely that on which the level was driving, causing a slight dislocation, and almost a total change in the nature of the vein; time sufficient has not since elapsed to admit of examination to any extent, but thus far it seems the ore is completely cut out. I noticed in my letter of last month that the direction of the veins in the levels of San Juan and La Luz approximated towards each other as the driving proceeded west; since then a junction has taken place, and the driving of San Juan suspended; in the present end of La Luz the veins, together, form a body two varas wide, containing a large proportion of azogue ores (bronzes) of very inferior ley, though they may be of the best quality; on former occasions ores from this level have frequently shown great and sudden variations in the ley, while they appeared of the same kind—this has also occurred in one of the veins sinking below the level. In the two veins called San Silvestre, the vein has been productive, and the ore good; but while from No. 1 the ore gives a ley of from twenty to thirty marcos per mouton, at No. 2 it does not contain above four or five marcos. A new waste called Reunion, was commenced sinking below La Luz about two weeks since, to make trial of two veins at the same time, as a small quantity of ore, of a promising appearance, had already been seen in the bottom of the level, and which would afford ventilation, and the means of carrying on the trials at the deeper level. The two network bargains in the Dios nos Gave, to convey fresh air, are completed, and are now perfectly well. The labor above San Francisco is gradually becoming less productive, and the number of paradises here are reduced from fourteen to eight, in order to continue the raising of ore at 700 or 800 cargas per week; in the ends of the waste, below San Francisco and of San Silvestre, the ore contains a ley averaging from twenty to thirty marcos per mouton. Total quantity raised in the month, 2135 cargas.

San Clemente, June 4.—Having examined the tortas in the hacienda, I find that the produce of June will not be under 11,000 marcos, including a few cargas of smelting ore at the mine; I beg, however, to repeat what I have stated in a former letter, that the mine has not improved—on the contrary, the ore are not so rich as in April.

June 12.—From Bolanos the news is the same as last; I intend to return to that district very shortly, and make every preparation for the abandonment of the mine, in the event of the trials proving a failure.

REAL DEL MONTE MINING COMPANY.

Real del Monte, June 9.—At Dolores we are going on regularly in sinking shaft below the Jubilee level; ground at present harder; down seven and a half varas below the level. We are driving north of the diagonal shaft, seven varas below Jubilee, to cut a part of the vein that we are in some level, and on which there appears to be soft ground for going on to cut the Santa Brigida vein, at level of the Avilaero adit. In the slopes below the San Juan level, east of San Luis waste, we have put designers to work in place of barrettes, which we think will answer better for breaking the azogue ore in the present state of the laborers. In 127 varas level, driving east of the Japan vein, the level is about two varas wide, in soft ground, which produces a ley of about five marcos per mouton. In the side adit, driving west of cross-cut south, seventy-three varas east, and the same level east of San Pedro cross-cut, 130 varas west of San Capetano, the ground is favorable. In Taylor's 345 varas level the ground is hard, with a little azogue ore; as soon as a communication is made with Santa Margarita we shall put designers to stop the side and back of level on azogue ore. In Santa Margarita the level is two varas wide, containing azogue ore of low ley. We are stopping the back of El Socorro in different places, and also the bottom of San Alfonso waste, and about Terrore shaft, where there is azogue and some smelting ore. In El Socorro 220 varas level, east of Socorro waste, the ground is favorable, with azogue and smelting ore of good quality. Rise, in back of Esperanza Level—Ground moderate, with a little azogue ore of a low ley. On the 20th May we commenced to clear San Francisco from the top of the adit, set to two Englishmen, who are to pay all costs of maintenance, dispatchers, and architects, to reach the adit, which is fifty varas; the clearing will be about three varas weekly. In twenty-seven varas level, driving south, the ground is moderate; the Santa Ynez vein—level one and a half varas wide. In the adit level, driving north of same vein, poor and hard. Santa Ynez waste, twenty-seven varas below adit, four designers working, and raising azogue ore. In the two past weeks there has been a little azogue ore at El Socorro shaft, on the Santa Brigida vein—ground soft; also a little azogue ore at twenty-five varas level—level one and a half to two varas. Designers are employed stopping back of twenty-five varas level, north and south of cross-cut, raising azogue ore. In San Pedro shaft ground still hard. We have commenced sinking the Amata shaft below the San Pedro, or sixty-six varas level, where there was a good branch of smelting ore, but, having sunk four varas, have again got to water, and obliged to suspend the sinking. In San Pedro level, east of Amata shaft, hard ground—a small quantity of good ore. In San Guillermo waste, below Guadalupe, or forty varas level, there is a good branch of smelting and azogue ore, but not so good as it was a few weeks since. Since the water left La Luz bottom we have been sinking the waste, where there is azogue ore; we are also stopping north of the mine.

June 10.—I am happy to state that, at Amata, prospects, upon the whole, are as favorable as for some time past, and do not expect any discontinuation of this or similar for the next few months. You will observe that the returns for the present year have rather exceeded the costs, although charged

with much extra expenditure—as the Dolores new engine—and I consider that the present appearance of the concern warrants the opinion that the result for some months to come will be the same, and that we may reckon on being able to continue to remit sufficient funds for all usual payments.

June 20.—I beg to inform the court that I have obtained a license to export 500 bars of silver on the payment of the duty in advance. I shall cause every exertion to be made to obtain a good parcel of bars to be dispatched by our waggoners about the end of July, by which time I hope to obtain from \$90,000 to \$100,000 (say, \$100,000), which, allowing twelve days for their conveyance to the coast, ought to be in England about the end of September, or about the time the bill I have now drawn for 2000l. will become due, and thus the court will have ample funds to meet the future drafts. The Japan vein, 137 varas level south of Dolores, has improved, producing ore in abundance, of fourteen marcos per mouton. As this is quite a new thing, and the ore different from any we have hitherto seen, we do not yet know if it will answer well for the patio; we shall soon, however, make trial, and let you know further on the subject.

ST. JOHN DEL REY MINING COMPANY.

Morro Vello, May 19.—Average of fifty-nine heads, eighteen days, 37-7 per day. Mine—Sinking down Baha shaft; one stop working in Gamba; a new stop taken up to-day, making the seventh; this level is looking worse; it is smaller, and more mixed with killas. In Louisa shaft (sinking) by the latter end of this month the pumping arrangements will be completed, and more progress made in deepening the sump. Driving west will commence next week, by which time the stopes will have been cleared of the soft black formation collected at the western part of the mine. In June a shaft west of Rouse's will be put down. Champion Mine—The driving here has been interfered with by the putting in a timber in the vicinity of the old workings. The stone of the upper stopes is, as usual, inferior; a new whim to haul from Maria and Prudentia's shafts will go to work to-morrow. The arrastre now works day and night without additional force; a box is placed below level from bed of arrastre, connected with it by a flashboard; when the sand is ground it is thrown into the box by the stones revolving forty-eight cubic feet; three tons of sand are now treated in twenty-four hours. Water—None left in tanks.

Diary.—May 14.—Plenty of stone to keep stamps going till Tuesday morning. The arrastre grinds much more sand; two new stones have been put in.

May 19.—The last stop in Gamba shows the level throughout to be much worse; the pure lode stone is now seen only against the hanging wall, from one to two and a half feet in thickness throughout; in the sump, where there was formerly a great proportion of the good stone, only two feet of it is now left.

May 20.—Told Capt. Stree to put a pair of men to cut through the foot-wall of Gamba at second stoppe from shaft (sump), to see what sort of lode, if any, exists there, upon which, at surface, a pit was sunk last May, and nine tons stamped, yielding 84 cts. per ton.

May 25.—Average number of heads working twenty-eight days, 37-9 per day. Mine—Baha sinking, one stop working; in lode no alteration. Champion—Stopping down breast of ground, west of Quebra Pasa, to effect a communication by stopes between Champion Mine and Baha sump; this we hope will be completed in three months at furthest; the stone in deepest stopes (eastern) at Champion continues to improve as the workings deepen. Driving west, at tramroad level, stopped to-day for the present; at this horizon the lode is irregular and uncertain; when the stopes below shall have reached the same extent, and made clearly evident the direction of the lode, driving will be commenced; the new whim at this mine went to work on the 19th instant. Gamba—The lode throughout its length has become worse; the hard stone is almost entirely displaced by killas, and exists near hanging wall only, in breadth from one to two and a half feet; the killas continues impregnated with lines of pyrites, but the lode itself is narrower. We shall next month treat the ore from this mine separately, to see what it gives. In May last year a pit was sunk upon a line a few feet north of the Gamba, from which nine tons were stamped, and gave well; a cross-cut has been commenced from bottom in Gamba to prove this line in depth; by the middle of next month we expect to reach it. A plunger lift will be put down first week in June. Louisa—The lode continues as good as ever; the black formation which had accumulated in western part of mine previous to sinking Rouse's shaft having been drawn to surface, driving was recommenced, but the extreme heat, and suffocating arsenical fumes in the end, made it necessary to withdraw the men. The stopes must be advanced further west to enable, by ventilation of the workings, further extension of the mine. A new shaft, five fathoms west of Rouse's, was pitched here on 20th instant. Surface Works—Bed of brook having been cleared out, filled afresh with good clay soil, and the pump done away with, each day's work gives an improved appearance to the house dam. A sand pass and measure-box are in hand for arrastre, to expedite the throwing in charge. Launderers are in course of erection, to carry water from cistern to reduction house, to supply Lyon strikes then completed; the water now required for the skins will go over the wheel, and add some five blins per minute to the Lyon 30-heads. It is necessary to bring more water home from Christie's to supply this fresh call; a miner and six men are employed on the duty, and by the time the launders are up they will have the required supply. A bullock road from western part of mine to intended site of new mine will be commenced on Monday, and the stone broken from rock overhanging Baha stage, which will be required for wheel pit, carried along it. The ground will be levelled, so as to serve hereafter for transit of mineral from mine to stamps. The removal of this hanging mountain, which looked very, and was, dangerous, has been carried on expeditiously by the company's blacks in overtime, after completing their tasks at the mine; when the rock shall have been sufficiently reduced the stones will be removed, and mine forge built; surface above forge will be occupied by a capstan; health of blacks continues excellent.

Diary.—May 26.—Went over Christie's last—more water will be required from this source. It has been decided to carry launders from reduction house to Lyon stamps, to supply her strikers with water—that used now for this purpose will be so much additional power to wheel, and make a difference (estimated) of five or six blins per minute per wheel. At one part an adit fifty yards in length will cut off a round of 600 yards, and add nearly two feet to the incline of the course, giving more freedom to the stream over the source, as it will be necessary to bring home for the new stamps double the stream now used. The adit is good ground for speedy driving, and will be got through by two men in about a month.

IMPERIAL BRAZILIAN MINING ASSOCIATION.

Gongo Soco, May 23.—My last was under date the 13th inst., duplicate of which accompanies this. It is with no small satisfaction that I call your attention to the great improvement in the produce from the mine which has taken place in these last few days. The gold has been obtained to the east of Curia's, at the horizon of the forty-one fathom level. The engine commencing there was some good stuff for the stamps between Curia's and an old shaft called Gibson's, commenced driving a level from the former towards Gibson's parallel with the old forty-one fathom level, but distant from it, and more to the north nine feet; in the progress of driving a good vein of gold was met with, which has kept the working house in full activity the last three days; the vein is still looking as kindly and promising as the day it was cut; the engine cannot speak with certainty as to the extent of the whole ground either above the level or horizontally, but they do not think there is much under the level—however, all is untouched virgin ground, and as the vein is going down it will be an interesting fact to arrive at, whether the gold continues downwards or follows the same course as the other veins in this neighborhood did, of ceasing to be productive at this horizon; the vein from which the gold has been obtained is the old north vein. In other parts of the mine nothing of interest has occurred since my last.

J. K. A. CRICKETT.

June 1.—We beg to lay before you our report for the works performed in this mine for the last month. In the beginning we commenced to drive a side level, east of Curia's shaft, at the horizon of the forty-one fathom level (the old level being crushed together), to prepare for re-opening some old back in that part of the mine, and on the 19th we met with a good vein of gold in the same level, which gave several boxes of good stuff for the washing-house. In this place we have driven thirteen fathoms, and holed it to some old workings near Gibson's shaft. This is a continuation of the old north vein, and although the vein is wrought out in the back of the level in places, we hope there is a good chance in the bottom, where the vein is whole. Yesterday we commenced to open a rise in the back of the level to prove the vein, and for ventilation; we have also obtained a little gold from the back of the twenty-one fathom level, at Curia's shaft; and a little from the back of the fourteen fathom level, at Walker's and Alcock's. In the fifty-two fathom level, west of Veezy's, we have driven two fathoms; the ground here is favorable for working, but poor. In this part of the mine we have made but little progress during the month, in consequence of the main belt breaking at Veezy's engine; now the water is again drawn out we have commenced to drive again at that horizon. In the forty-eight fathom level, at Curia's, we have driven about 5 fms. 2 1/2; here the ground is very soft and wet for driving; nothing particular has been met with in that part. The twenty-one fathom level, west of Curia's, has been driven seven fathoms, and holed to the twenty-one fathom level, east of Curia's; this is on the Curia formation; the vein likewise has proved poor in this part. The shallow level, at Anguine's, has been driven west twelve fathoms; here the vein shows a sample of gold, but not rich; the cross-cut at the horizon of the level level, at Anguine's, has been driven fourteen fathoms, but nothing particular has been met with in that quarter. The cross-cut, at the horizon of the middle level, at Alcock's, has been driven north twelve fathoms; this cross-cut is intended to be driven through the footings to prove if there are any more productive veins in the north part, but likewise without success. We have laid down several fathoms of tunnel in Walker's level to prepare for opening back in the eastern part of the mine.

Propositions for the present month.—The sixty-two fathom level to be driven further west.—The four fathom level, at Curia's, to be driven further south.—The cross-cut, at the horizon of middle level, at Alcock's shaft, to be driven further south.—A waste to be sunk in bottom of the twenty-one fathom level, at Curia's.—A level to be driven east, at the horizon of the forty-eight fathom level, at Curia's shaft, on north vein.—A rise to be opened in back of forty-one fathom level, at Curia's.—A new shaft to be sunk east of Gibson's, to facilitate the workings in that part of the mine.

T. BLAMEY. T. PENKILLIST. JOHN LUCK.

Gold Report.

1842.	Stamps.	Lbs. oz. dwt.	Total.	Lbs. oz. dwt.
May 10	13 4 10	17 2 10	7 4 10	
" 20	"	"	10 2 1	
" 21	"	"	8 9 10	
" 23	"	"	4 11 1	
" 24	"	"	10 9 3	
" 26	"	"	11 3 13	
" 27	"	"	15 3 10	
" 28	"	"	8 7 6	
" 29	"	"	3 2 1	
" 31	"	"	30 8 9	
June 1	"	"	19 8 1	
" 2	"	"	6 8 10	

Raised from the 10th of May to the 2d of June, inclusive (eighteen days)—Stamps, 43 lbs. 11 oz. 18 dwts.—Total raised from the 1st of January to the 2d of June, 262 lbs. 11 oz. 11 dwts. 10 grs.

BRAZILIAN COMPANY.

Cala Branca, May 19.—I am pushing to the utmost the different works in progress. The bottoms continue to look well.

June 4.—We have been much hindered by having to repair the damage caused by the falling away of some timber from two of our shafts. I am happy to add that no serious hurt to any one occurred. We are in the midst of the dry season, and our wheels, in consequence, going very slowly; I trust, by-and-bye, to remedy this great evil.

Gold return for three weeks to 3d June, 50 lbs. 9 oz. 12 dwts. 10 grs.—Ditto for the month of May, 50 lbs. 4 dwts. 3 grs.

ENGLISH MINES.

TERGOLLAN MINING COMPANY.

Aug. 14.—The sumpmen have nearly completed the cutting of the whim-plat, &c., at the fifty fathom level, and I expect shortly to begin sinking for the sixty fathom level; in cutting said plat we have raised some very excellent stones of ore from the north part of the lode, which is about ten feet wide; the end eastward of this level, which is being driven on the south part of the lode, is producing a small quantity of ore. The lode in the waste below the forty fathom level is large, and occasionally producing good stones of ore; the lode in the pitches below continues much the same. We have sampled to-day, at Wadbridge (computed), forty-eight tons of good quality ore.

J. NIMBLE.

TRETOLL MINING COMPANY.

Aug. 15.—The lode in the forty fathom level, east of Williams's shaft, is fifteen inches wide—tribute ground. The lode in Henwood's shaft is one foot wide—tribute ground. The lode in the waste sinking under the thirty fathom level, east of Henwood's shaft, is six inches wide, producing a small quantity of ore. The tin lode which we are stopping at the adit level, east of Morcom's shaft, is seven feet wide, and very good tin ground. The north part of the Mine park lode, west of John's shaft, the adit level is fifteen inches wide, very good tribute ground. We have sampled this day 177 tons of ore.

H. WILLIAMS. J. MORCOM.

HOLMBUSH MINING COMPANY.

Aug. 15.—The lode in the 110 fathom level west is ten inches wide, producing stones of ore; in the waste sinking below the level the lode is still divided into small branches, and yielding but a small proportion of ore. Lode in the 100 fathom level is fourteen inches wide, worth 10c. per fathom; in this level east the lode is six inches wide, and intersected with ore. The lode in the eastern stopes, in the back of this level, is two feet wide, worth 24c. per fathom; in the western stopes, in back of ditto, the lode is two feet wide, worth 40c. per fathom. The cross-cut towards Flagship lode, at this level, is still hard ground. In the twenty-five fathom level the lode is sixteen inches wide, worth 20c. per fathom. The lode in the eastern stopes, in back of this level, is twenty inches wide, and worth 24c. per fathom. The lode in the middle stopes, in back of this level, is eighteen inches wide, worth 22c. per fathom; in the western stopes, in back of ditto, the lode is two feet wide, and worth 40c. per fathom. In the eighty fathom level the lode is eighteen inches wide, composed chiefly of monite and spar; the cross-cut at this level, towards the north lode, is still going on with good progress; the lode in the stopes, in the back, is twenty inches wide, worth 4-1/2c. per fathom. In the sixty-two fathom level east the lode is small and unproductive. The pitches, upon the whole, are looking favorable.

F. FRANKS.

NEWPORT UNITED MINING COMPANY.

Aug. 15.—The lode in the forty fathom level west is fifteen inches wide, at present unproductive; at this level east the lode is in general appearance may be considered very kindly, being about three feet in width, carrying monite and spar, and producing in places fine stones of copper ore. In the twenty-five fathom level the lode is large and kindly, but at present comparatively unproductive, not worth more than about one ton of ore per fathom. In the thirty fathom level east the lode is about two feet wide, chiefly spar and monite; the ground about the lode is becoming easier, and will admit of more satisfactory progress driving the level. The twenty fathom level east has been suspended for the sinking of a waste for air, from the bottom of this level to back of the thirty. The pitches are without much alteration.

J. H. HIGGINS.

WEST WHEAL JEWEL MINING ASSOCIATION.

Aug. 15.—The seventy east, on Wheal Jewel lode, is eighteen inches wide, worth 10c. per fathom. The seventy west, on the same lode, is worth 2c. per fathom. The fifty-seven east, on this lode, is worth 5c. per fathom, and the forty-two east is worth 4c. per fathom. There is no alteration in any other part of the mine.

S. LEAH.

TRELKON CONSOLS MINING COMPANY.

Aug. 15.—In Christie engine-shaft the ground is rather better for sinking. In the rise, in the back of the seventy west, the lode is large, but not much mineral. The sixty west is one foot wide, not much ore. The fifty in driving to get under Curia's shaft. The waste sinking under the forty fathom level is worth 10c. per fathom. In Good Fortune shaft the lode is two feet wide, worth 10c. per fathom. The lode in the forty-four fathom level has not been taken down. W. STANLEY.

TAMAR SILVER-LEAD MINING COMPANY.

Aug. 15.—In the 100 fathom level the lode is one foot wide, still producing ore, but not rich. In the 110 fathom level we are still in soft ground, and have not yet reached the lode. In the 120 fathom level the lode is about two feet wide, and full of which is good work. In the ninety-five fathom level the lode is eighteen inches wide, carrying two small branches of ore. In the eighty-five fathom level the lode is one foot wide, chiefly composed of copper, intersected with silver lead ore. In the fifty-five fathom level the lode is two feet wide, one foot of which is good working ore. In the thirty-five fathom level the lode is eighteen inches wide, producing a small quantity of ore. At the north mine the ground in the engine-shaft is not quite so favorable for sinking. We are now down about fifteen fathoms under the adit; the engineers are now daily engaged in getting the engine—there have had some difficulty in getting the castings from the water side to the engine-house, which has somewhat delayed the work longer than was expected.

J. STANLEY.

CORNWALL MINING COMPANY.

Aug. 15.—Our sumpmen are engaged in cutting pit at the seventy fathom level. The sixty fathom level, which has been in the last few days, yielding fine stones of lead, although we do not calculate on reaching the top of lead ground as yet. The lode in the fifty fathom level is large, and promising a little lead; we have five fathoms to drive this level to get on far west at Morcom's shaft. The forty fathom level driving east of old ore shaft, on the north lode, has a promising appearance for the last few fathoms; in driving we have been passing through good ore ground. The sixteen fathom level, east of Morcom's shaft, on the north, gives a little lead. Blakely's shaft is now completed to the sixteen fathom level. We have holed Morcom's shaft to the rise from the back of the forty fathom level, the well could continue to descend for driving, and in a good state of ground the lode passing through. The cranking is at work, and goes on well.

A. WASS.

MINING NOTICES.

[Under this head we purpose circulating such paragraphs as may appear in the provincial and other Presses, bearing reference to discoveries and improvements in mining operations of home and abroad. It is hardly necessary to observe, that we must not be considered to admit the correctness of the information conveyed, which, in too many instances, requires cautious investigation—the opinions or representations of parties in some instances, and the want of honesty in others. We are of a degree of responsibility on a Journal in giving publicity to reports, which we do not intend taking upon ourselves.]

VALUABLE DISCOVERY OF COAL IN YORKSHIRE.—A seam of very fine coal has recently been discovered in South-west York, about five miles east of Garmouth, in Yorkshire, much superior to any coal obtained from previous workings in that part of the country, but the place being almost inaccessible by roads, the inhabitants of that neighborhood will be the only people at present who will be benefited by the discovery.—*Durham Advertiser.*

CATTLE EATEN COLLEGE.—The owners of Castle Eden College have sunk to another crop of coal of excellent quality, and said to be about 10, the thickness.—*Ibid.*

GOLD MINES IN GEORGIA.—The American correspondent of the *Miner's Chronicle*, under date Philadelphia, July 19, writes—"The newly-discovered gold mines in Georgia prove immensely productive."

MINE ACCIDENTS.

Lowest Mine.—On Wednesday, the 14 inst., a boy, named Warren, was descending in one of the shafts of Lowest Mine, by some means he missed his footing, and fell two fathoms; but, although he fell very much, he was able to walk home, and, we are glad to find, is likely to do well.

PRICES OF MINING SHARES

Printed and Published by HENRY BARNES, the Proprietor, at the (Printers), 1, Crown-court, Fleet-street, in the City of London; where all Communications and Advertisements are requested to be forwarded, post-paid.